
AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method of determining a near neighbor to a target point in multidimensional space from among a set of candidate points, comprising:

generating a matrix of bins, wherein bin width is determined by the difference between a maximum and a minimum value, from among the set of candidate points, divided by the number of bins;

identifying a first bin that contains the target point;

locating a first candidate point in the first bin;

searching at least a second bin adjacent to the first bin for a second candidate point; and

calculating the distances between each of the first and second candidate points and the target point.

2. (Original) The method of claim 1 wherein the matrix of bins encompasses the target point and the candidate points.

3. (Original) The method of claim 1 wherein generating the matrix of bins includes, for each dimension, establishing a maximum and minimum bin limits to closely encompass the points.

4. (Original) The method of claim 1 including calculating the distance between the first candidate point and the target point prior to searching the second bin, and including determining which bin to search based on the distance between the first candidate point and the target point.

5. (Original) The method of claim 1 wherein searching at least a second bin adjacent to the first bin for a second candidate point includes searching all bins that include portions closer to the target point than the first candidate point.

6. (Original) The method of claim 1 wherein searching at least a second bin adjacent to the first bin for a second candidate point includes searching all bins that include portions potentially closer to a first selected point in the first bin than a second selected point in the first bin.

7. (Original) The method of claim 1 wherein searching at least a second bin adjacent to the first bin for a second candidate point includes searching all bins that include portions.

8. (Currently Amended) A method of determining a near neighbor to a target point in multidimensional space from among a set of candidate points, comprising:

generating a matrix of bins, wherein bin width is determined by the difference between a maximum and a minimum value, from among the set of candidate points, divided by the number of bins;

identifying a first bin that contains the target point;

searching the first bin for a first candidate point; and

identifying a set of proximate bins selected from the matrix, each of the proximate bins having at least a portion potentially closer to a first selected point in the first bin than is a second selected point in the first bin.

9. (Original) The method of claim 8 including searching the first bin for all candidate points and determining which of the candidate points in the first bin is closest to the target point.

10. (Original) The method of claim 9 wherein identifying the set of proximate bins includes selecting all bins having a portion separated from any portion of the first bin by a distance less than the distance between two maximally separated point in opposed corners of the first bin.

11. (Original) The method of claim 8 wherein the matrix of bins encompasses the target point and the candidate points.

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12. (Original) The method of claim 8 wherein generating the matrix of bins includes, for each dimension, establishing a maximum and minimum bin limits to closely encompass the points.
13. (Original) The method of claim 8 including identifying the location of the target point within the bin, and determining which proximate bins to search based on the location.
14. (Original) The method of claim 8 including searching each of the selected bins for candidate points, and calculating a distance from each located candidate point and the first candidate point to the target point, such that the nearest candidate point is determined.
15. (Original) The method of claim 8 including calculating the distance between the first candidate point and the target point prior to searching any of the proximate bins, and wherein identifying a set of proximate bins based on the distance between the first candidate point and the target point.
16. (Currently Amended) A pattern recognition ~~comparison~~ system comprising:
- a target point;
 - a plurality of candidate points; and
 - an analysis module executing on a processor wherein the analysis module is configured to generate a matrix of bins, to identify a first bin that contains the target point, to search the first bin for a first candidate point, and to identify a set of proximate bins selected from the matrix, each of the proximate bins having at least a portion potentially closer to the target point than the first candidate point.
17. (Original) The system of claim 16 wherein the module is configured to select all bins having a portion separated from any portion of the first bin by a distance less than the distance between two maximally separated point in opposed corners of the first bin.

18. (Original) The system of claim 16 wherein the module is configured to identify the location of the target point within the bin, and determining which proximate bins to search based on the location.

19. (Original) The system of claim 16 wherein the module is configured to search each of the selected bins for candidate points, and calculating a distance from each located candidate point and the first candidate point to the target point, such that the nearest candidate point is determined.

20. (Original) The system of claim 16 wherein the module is configured to calculate the distance between the first candidate point and the target point prior to searching any of the proximate bins, and wherein identifying a set of proximate bins based on the distance between the first candidate point and the target point.

21. (New) A method of determining a near neighbor to a target point in multidimensional space from among a set of candidate points, comprising:

- generating a matrix of bins;
- identifying a first bin that contains the target point;
- locating a first candidate point in the first bin;
- searching at least a second bin adjacent to the first bin for a second candidate point including searching all bins with portions closer to the target point than the first candidate point; and
- calculating the distances between each of the first and second candidate points and the target point.

22. (New) A method of determining a near neighbor to a target point in multidimensional space from among a set of candidate points, comprising:

- generating a matrix of bins;
- identifying a first bin that contains the target point;
- searching the first bin for a first candidate point;
- calculating the distance between the first candidate point and the target point prior to searching any of the proximate bins; and

identifying a set of proximate bins selected from the matrix based on the distance between the first candidate point and the target point, wherein each of the proximate bins having at least a portion potentially closer to the target point in the first bin than is the candidate point in the first bin.

23. (New) A method of mapping points in multidimensional space; comprising:

- generating a matrix of bins;
- identifying a first bin that contains the target point;
- identifying the nearest candidate point to the target point;
- calculating the distance between the first candidate point and the target point to establish a search radius within multidimensional space; and
- searching multidimensional space within the search radius for other candidate points.

24. (New) A method of locating and searching the nearest proximate bin to the target point for candidate points, comprising:

- generating a matrix of bins;
- identifying a first bin that contains the target point;
- searching the first bin for a first candidate point;
- wherein, if no candidate point is identified in the first bin then identifying the nearest proximate bin boundary to the target point;
- searching the proximate bin which shares the nearest bin boundary with the target point for candidate points;
- wherein, if no candidate points are identified in the proximate bin which shares the nearest boundary with the target point, then the proximate bin which shares the next nearest boundary with the target point is searched for candidate points; and
- wherein, if no candidate points are identified in the second nearest proximate bin to the target point, then the process of searching proximate bins is continued as described until a candidate point is identified.